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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,187	06/12/2001	Toshio Morita	Q61610	1960

7590 01/10/2006

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EXAMINER	
LISH, PETER J	

ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 09/878,187	**Applicant(s)** MORITA ET AL.	
	Examiner Peter J. Lish	**Art Unit** 1754	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 16 December 2005 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 6 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☒ The Notice of Appeal was filed on 12/16/05. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: _____.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: see continuation.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☐ Other: _____.

Response to Arguments

Applicant's arguments filed 12/16/05 have been fully considered but they are not persuasive. The applicant argues, with respect to the rejection over Tennent et al. in view of Lambert et al., that Lambert teaches only the purification of single-walled carbon nanotubes. Applicant additionally argues that it would not be obvious to one of ordinary skill to perform the purification process of Lambert on multi-walled carbon nanotubes because it is taught that certain purification treatments that are effective for multi-walled nanotubes are known to be ineffective for the purification of single-walled nanotubes.

However, it is known to one of ordinary skill in the art that these purification treatments to which Lambert refers (i.e. the use of strong oxidizing agents) are ineffective on single-walled nanotubes because the single-walled nanotubes are destroyed under such harsh conditions. In no instance has a purification process that is effective for single-walled nanotubes been shown to be ineffective for multi-walled nanotubes. Moreover, Lambert et al. discuss the production of multi-walled nanotubes and despite no specific examples dealing with their treatment, it is taught that catalyst impurities are detrimental to multi-walled nanotubes in the same manner they affect single-walled nanotubes. It therefore would have been obvious to one of ordinary skill to perform the purification treatment of Lambert et al. on multi-walled carbon nanotubes, such as those produced by Tennent et al.

The applicants additionally argue that the process of Lambert et al. is not capable of achieving the desired catalyst impurity level. However, it is noted that such a conclusion is based upon the applicant's assumptions. It is taught that the process of Lambert is capable of removing greater than 90% of the catalyst from the nanotube sample. The applicants have

therefore taken a 90% reduction of the catalytic material in their specific example to show that the process is incapable of achieving the claimed impurity range. However, it is noted that nanotube samples may contain different starting weight percentages of catalyst depending on their growth conditions. Samples that are grown for a longer period of time from larger catalyst particles (resulting in longer and thicker fibers containing more walls) have a lower weight percentage of catalyst material. Furthermore, some processes for the growth of nanotubes use multi-metallic catalysts and therefore may contain a low weight percentage of iron, cobalt, and nickel (the claimed metals) in the nanotube samples. Therefore, in many cases, a greater than 90% catalyst removal will result in a nanotube sample having the claimed impurity concentration.

Moreover, the claim is directed to a single carbon fiber, or multiwalled nanotube, as opposed to an entire sample. Therefore, even should an entire sample not be purified to contain a catalyst impurity concentration within the claimed range, it may still be expected that at least one fiber from the sample meet the desired impurity concentration.

Additionally, it is argued that the process of Lambert differs from that of the applicants in that the carrier gas is not vented through the highest temperature section of the furnace. However, it is noted that this process step is not expected to aid in the catalyst removal from the nanotubes, as is currently argued. Rather, this step is taught to prevent the metals from solidifying and damaging the process equipment. The catalyst removal effectiveness of the process of Lambert is therefore expected to be the same as the process of the applicants, as no difference is seen between the processes that would account for a difference in effectiveness.

The applicants additionally argue with respect to Lambert et al. that the production of the single-walled carbon fibers of Lambert et al. is not a "thermal decomposition" process. However, it is noted that this is a process limitation and does not limit the product itself. Moreover, it is noted that the purification treatment of Lambert et al. is relied upon and not the process of making the nanotubes.

The applicant's argue with respect to the rejection over Colomer et al. that the x-ray diffraction that is relied upon to show a complete removal of catalyst impurities from the nanotube sample is unreliable below a particular concentration. However, it remains that Colomer et al. teach a complete removal of catalyst is possible and unless the applicant shows otherwise, the teaching of Colomer et al. is relied upon and maintained. Additionally, there is no reason to expect that the process of Colomer et al. is not capable of achieving such an impurity concentration. It is suggested that the applicant repeat the process of Colomer in order to show that it does not achieve the claimed catalyst removal.

Moreover, as with the rejection over Lambert et al., different nanotube samples contain different amounts of catalyst residues and therefore the claimed impurity concentration may be met by a process that is less than 100% effective in catalyst removal.

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